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(71)(72) Applicant and Inventor: LAWTON, Peter, A. [AU/AU]; 101 Beaumont Road, Berwick, VIC 3806 (AU). (74) Agent: PHILLIPS ORMONDE & FITZPATRICK; 367 Collins Street, Melbourne, VIC 3000 (AU).			
(54) Title: PLANT GROWTH CONTAINER WITH LOCATING MEANS ON THE BASE AND STORAGE SYSTEM			
(57) Abstract			
<p>A plant growth container (1) of the kind having a perforate side wall (3) to permit air pruning of the laterally extending root system of a plant. The container has a base (2) which is connected to the side wall and which is provided with locating means (26) adapted to cooperate with retaining means (29) so as to thereby resist movement of the container (1) out of an upright position. In one arrangement the locating means (26) is a cavity in the center of the base (2) and the retaining means is a peg-like member (29) which is receivable in the base cavity. The container (1) can form part of a plant storage system including a tray (30) adapted to support a plurality of containers (1) and having separate retaining means (29) for each container.</p>			

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- 1 -

Plant growth container with locating means on the base and storage system

This invention relates to containers for storing growing plants and also relates to a plant storage system involving the use of such containers. The invention is particularly concerned with above ground storage of growing plants
5 which are intended for eventual transfer to the ground.

The word "plant" as used throughout this specification is to be understood as embracing all forms of plant life, including shrubs, bushes and trees, having a root structure which extends at least during the early stages of growth of the plant. Furthermore, the invention will be hereinafter described
10 with particular reference to plants being grown in a soil based growing medium, but the invention is not limited to such circumstances. By way of example, a container according to the invention might be usefully adopted in the application of gravel hydroponics.

A container for the root ball of a growing plant is the subject of
15 Australian Patent No. 629067. A particular feature of that container is the side wall arrangement which promotes air pruning of the expanding root structure. The arrangement is such that laterally extending roots are directed towards openings of restricted size formed through the container side walls. The root growth which extends to the openings is air pruned in a known manner, thus
20 causing secondary roots to form. The same growth and air pruning process is repeated with the secondary roots. The root system thus obtained, forms a well matted and cohesive root ball which is ideal for transplantation.

The container of patent 629067 suffers the disadvantage of not having a base. The container is in effect a tubular member formed of a flexible panel,
25 the upright edges of which are secured together to retain the tubular form of the container. A problem with that container, and other containers which do not have a base, is that it is difficult to transport the container from one place to another while soil and/or a plant remain within the container. Because of that difficulty, such containers are not considered suitable for use in circumstances
30 where the container is to be filled at a central potting machine with the growing

- 2 -

media and then transported to another location at which the container is to be stored while the plant is growing.

A further problem with the containers of patent 629067, and similar containers, is that there is no control of downward root extension comparable 5 to the control imposed on lateral root extension. It is therefore generally necessary to locate the container on a surface which cannot be penetrated by downwardly extending roots, or to otherwise guard against uncontrolled downward extension of the root structure into the underlying soil or gravel, because such downward extension tends to reduce lateral root growth.

10 Australian patent application 51865/93 is concerned with a container of the general kind disclosed by patent 629067, but which is provided with a base. Various base constructions are referred to in the specification of application 51865/83, but in practice the only generally acceptable base is one formed of an imperforate plate of sheet metal. That form of base has two 15 serious drawbacks. One is the absence of air pruning for downwardly extending root growth, and the other is the relatively short useful life of the base as compared with the useful life of the container body or side wall. It is found that the average lifespan of the side wall is ten uses of approximately six months each, whereas the base is usually discarded after two uses, each 20 lasting approximately six months.

Containers of the kind to which patent application 51865/93 and patent 629067 are directed, are intended for above ground use. That is, the container with a plant in place is stored on the ground or another surface rather than being embedded into the ground. A serious difficulty encountered with such an 25 arrangement is the possibility of the container toppling over in transit from one place to another, or as a consequence of exposure to wind of moderate to high strength. Toppling of the container can cause damage to the plant and increases the difficulty of maintaining the condition of stored plants and the environment in which they grow.

30 Plant storage systems utilising containers of the foregoing kind require delivery of water to the plants to ensure that their moisture content is

- 3 -

maintained at a satisfactory level. It is economically sound practice to enable recycling of water which drains from the containers, and prior to the present invention such recycling required extensive and costly preparation of the area of land on which the containers were to be located.

5 It is an object of the present invention to provide a plant container of the general kind discussed above which has an improved base. It is another object of the invention to provide an improved plant storage system including the use of such a container. It is a further object of the invention to provide such a plant storage system which utilises a novel method for recycling water
10 used to provide moisture for the growing plants.

A container according to the present invention is characterised in that it includes a side wall, a base attached to the side wall, and locating means provided on the base and arranged for cooperation with a support in a manner such as to resist movement of the container out of a substantially upright
15 position. In one form of the container, the base is made of the same material as the side wall, or a similar material, so as to have openings at which downwardly extending roots can air prune. It is preferred that the locating means includes a recess or cavity formed in the undersurface of the container base and located substantially centrally of that base.

20 A storage system according to the present invention is characterised in that it includes a container support which is cooperable with a container as described above so as to hold that container substantially upright. The support may also function to hold the container base above a surface so that an air space is provided between that surface and the base. That air space is
25 preferably of a size adequate to ensure air pruning of plant roots which reach the holes in the container base.

It is preferred that the container support is part of a support structure which includes a plurality of such supports arranged in suitably spaced relationship. By way of example, the supports may be arranged in rows which
30 are laterally spaced apart a predetermined distance which ensures adequate spacing between adjacent containers mounted on the support structure.

- 4 -

- Adjacent container supports of the same row may be spaced apart by the same predetermined distance, or a similar distance. The arrangement is preferably such that the spacing between adjacent containers of a predetermined size enables sufficient light and air flow between the respective
- 5 plants of those containers to ensure satisfactory growth conditions for the plants.

The support structure can take any suitable form, including a frame which can be disposed on the ground or other surface. In one preferred arrangement the support structure includes a tray having a floor and an

10 upstanding wall extending around the periphery of that floor. The floor and the periphery wall combine to define a collection space for water, and means may be provided to enable water collected in that space to be drawn off for re-use as a source of water for the stored plants. Any number of container supports can be provided across the floor of the collection tray. It is preferred that the

15 container support structure is mounted on or forms part of a pallet of standard size adapted to be lifted and moved by conventional forklift vehicles. If the support structure is to be mounted on a separately formed pallet, it preferably has a shape and size substantially corresponding to the shape and size of the pallet when viewed in plan. Alternatively, each support structure may have a

20 shape and size such that when combined with one or more support structures of the same kind the combined assembly of such structures has a shape and size substantially corresponding to the shape and size of the pallet when viewed in plan.

Embodiments of the invention are described in detail in the following

25 passages of the specification which refer to the accompanying drawings. The drawings, however, are merely illustrative of how the invention might be put into effect, so that the specific form and arrangement of the various features as shown is not to be understood as limiting on the invention.

In the drawings:

- 30 Figure 1 is a semi-diagrammatic view of a container according to one embodiment of the invention.

- 5 -

Figure 2 is an enlarged cross sectional view of the container shown by Figure 1.

Figure 3 is a view of one form of clip for use in assembling the container of Figures 1 and 2.

5 Figure 4 is a plan view of another form of base for the container of Figure 1.

Figure 5 is a cross-sectional view of part of a container according to another embodiment in which the base is of the same material as the side wall.

10 Figure 6 is a perspective view of a container base according to yet another embodiment of the invention.

Figure 7 is a semi-diagrammatic cross-sectional view taken along line VII-VII of Figure 8 showing a container mounted on the support structure of Figure 8.

15 Figure 8 is semi-diagrammatic perspective view of one form of support structure for use with a container according to the invention.

Figure 9 is a plan view of still another form of base for a container according to the invention.

Figure 10 is a partially sectioned enlarged side elevation view of the container base of Figure 9.

20 Figure 11 is an enlarged sectional view taken along line XI-XI of Figure 9.

Figure 12 is a perspective view of a container according to the invention including a base as shown by Figures 9 to 11 and in which the part of the container is shown removed for convenience of illustration.

25 Figure 1 shows a container 1 which incorporates an embodiment of the invention and which is of the general type disclosed by Australian patent application 51865/93. It is to be understood however, that the invention is not limited to use with the container as shown, but may be used with any suitable container of any suitable shape. That includes any tubular container of 30 cylindrical, square or other cross-sectional shape and the side wall of which is smooth or dimpled as shown.

- 6 -

The container 1 as shown includes a circular base 2, which can be attached to the container side wall 3 in any appropriate fashion. In the arrangement shown, the base 2 is located within the tubular section of the container 1 so as to be surrounded by the side wall 3, and is retained in position by cooperation with that side wall. The side wall 3 is preferably formed as described in patent 629067, so that the inner surface of that wall has a series of rows of inwardly projecting cones or cusps 4 (as seen in Figure 2), and a recess 5 is formed between each two adjacent rows. The peripheral edge portion 6 of the base 2, or at least part of that edge portion, is positioned within one such recess 5, and the recess 5 may be selected so that the base 2 is elevated above the lower edge 7 of the side wall. The base 2 is thereby supported by the cones or cusps 4 of the row which defines the lower boundary of the recess 5 in which the base edge portion 6 is located.

Elevation of the base 2 enables an air gap 8 to be provided within the confines of the container 1 below that base 2. Assuming an air gap is required below the base 2 it need not be provided in the foregoing manner, and consequently the base 2 can be located, if desired, at the extreme lower edge 7 of the side wall 3.

In the particular arrangement shown, the overlapping upright edges of the panel which forms the side wall 3, are held together by a wire clip 9. It will be appreciated that other fastening means could be used for that purpose. If a clip 9 as shown is used, the base 2 may be provided with a hole 10 to permit passage of one leg of the clip 9, but that will not be necessary in all situations. If the container is of relatively small size, only one clip may be required, and that could be at the top rather than the bottom of the side wall 3 as shown. In some cases however, there will be a need for a clip 9 both at the top and the bottom of the side wall 3.

Figure 3 shows in more detail the wire clip 9 which may be used to form the container side wall 3 from a panel. The clip 9, is simply a resilient fastener formed from any suitable material, which engages each of two overlapping edge portions of a panel so as to clamp those edge portions together and

- 7 -

thereby form the upright side wall 3 of the plant growth container. An example arrangement of that kind is shown in Figures 1 and 2.

The container base may or may not be imperforate. Figure 4 shows one form of base 11 which has a series of openings 12, and those openings 12 are 5 preferably of limited size to allow for air pruning of the plant roots.

In another arrangement as shown by Figure 5, the base 2 is formed of a plate-like member 20 having the same shape characteristics as those of the panel forming the side wall 3. That is, the base 20 is formed with a series of cones or cusps 21, at least some of which have a hole 23 of limited size at the 10 apex or terminal end. With such an arrangement, the cusps 21 serves to guide downwardly extending roots to the holes 23 in the base in the same manner as laterally extending roots are guided by the cones or cusps of the side wall 3. The base 20 therefore acts as a root control barrier in the same manner as the side wall 3 functions as such a barrier. Assuming the base is sufficiently rigid, 15 it may also function as a load supporting platform for the contents of the container.

The base 20 is formed of the same material as the side wall 3, which may be a vacuum moulded sheet of suitable plastics material. One material suitable for that purpose is Cusped Core sheet material as manufactured by 20 Nylex Corporation Limited. Sheet material of that kind may have a thickness in the range of 0.5mm to 1mm and consequently does not have a great deal of load bearing strength. In order to overcome that deficiency the base 20 may be formed so as to have a number of integral strengthening ribs 24 as shown in Figure 6. The shape, size, longitudinal extent and number of such ribs 24 25 can be selected to suit particular circumstances. It is also preferred that a strengthening bead 25 of suitable cross-sectional shape be provided around the periphery of the base 20.

Substantial benefits are derived from use of a perforate base in a container of the kind under discussion, particularly if an air space is provided 30 beneath the base to enable air pruning of downwardly extending roots. A container incorporating such a base provides for relatively free drainage of

- 8 -

water at both the sides and the bottom of the body of the growing medium within which the plant is located, and that enables relatively consistent moisture retention conditions to exist at all parts of the plant root structure. A further benefit is the relatively constant aeration which is achieved throughout
5 the body of the growing medium because of the presence of a perforate boundary layer at both the sides and the undersurface of that body.

The container base, in any of its possible forms, is provided with locating means 26 which is cooperable with a support so as to at least reduce the possibility of the container 1 toppling over or being inadvertently shifted from a
10 selected position. The form and position of the locating means 26 can be selected to suit particular circumstances. In the example arrangement shown by Figures 1 to 6 of the accompanying drawings the locating means is provided at the approximate center of the base 2 and is in the form of a cylindrical cavity 27 extending upwardly from the undersurface of the base 2. With the
15 arrangement as shown, the cavity 27 is formed in a cylindrical member 28 which projects upwardly from the top surface of the base 2.

A support for use with the container base 2 as described above will include a spigot or peg-like member 29 which is locatable within the cavity 27 of the container base 2 (Figure 7). It is preferable that the member 29 is of
20 cylindrical form, but that is not essential. The member 29 may be secured to the ground or a structure so as to be held or restrained against movement.

It is preferred that the member 29 forms part of a support structure 30 which is adapted to cooperate with a container 1 in a manner such that the container is held in a stable manner. It is further preferred that the structure 30
25 cooperates with two or more containers 1 in a manner such that those containers are held apart by a suitable distance. The support structure 30 could be formed in any suitable manner or style and can be formed of any suitable material. By way of example, the structure 30 could be in the form of a metal frame. Ideally, the support structure 30 is formed so as to be part of or
30 locatable on a pallet which can be transferred from place to place by a forklift vehicle. That enables the containers 1 with plants in place to be stored on a

- 9 -

pallet such that it is convenient to move the containers from one location to another as required. That is, the containers remain on the pallet during the development period of the plants held by those containers.

An example support structure 30 is shown by Figure 8. In that example,
5 the structure 30 includes a tray-like body having a floor 31 and an upstanding wall 32 extending without interruption around the periphery of the floor 31. A liquid collection space is formed within the wall 32 and above the floor 31 for a purpose hereinafter described. A series of support members 29 is provided across the upper surface of the floor 31, and each member 29 may be formed
10 integral with the floor 31.

In the Figure 8 arrangement it is preferred that the members 29 are arranged in rows which are spaced apart by a predetermined distance. It is also preferred that adjacent members 29 of the same row are spaced apart by substantially the same predetermined distance. The predetermined distance is
15 selected according to the size of the containers to be supported by the particular structure 30, and is intended to ensure that sufficient light and air flow exists around each plant for the proper development of the plant.

Assuming air pruning of roots reaching the container base 2 is required, each member 29 may project upwardly from a platform 33 which is raised
20 above the upper surface of the floor 31. Each platform 33 is designed to be engaged by the undersurface of a container base 2 as shown in Figure 7 so that an air space 36 adequate for air pruning purposes exists between the base 2 and the floor 31. The area or lateral extent of surface engagement between the container base and the platform 33 can be selected to aid in
25 minimising the possibility of the container 1 toppling over. Each platform 33 as shown has a smooth uninterrupted surface in engagement with the container base 2, but that is not essential. The platform 33 could be formed by ribs or bars extending radially out from the member 29 so as to maximise the distance they extend from the member 29 whilst retaining maximum exposure of the
30 underside of the base 2 to air for air pruning purposes.

- 10 -

The ability of the support structure 30 to collect water enables that structure to form part of a water recycling system. Water collected in the structure 30 can be drawn-off at one or more outlets 34 for re-use as required. The floor 31 may be provided with gutters 35, channels, or other suitable
5 means for encouraging water to flow across the floor 31 towards the outlet 34.

Releasable locking means may be provided to retain a container 1 against dislodgment from its position on the container support. By way of example, in the case of a support having a spigot or peg-like member 29, the releasable locking means may act between that member and part of the
10 container base 2. The locking means could, for example, include two cooperable parts which are rendered active or inactive by relative rotation of the container 1 about the longitudinal axis of the member 29. Alternatively, in an arrangement including use of the support structure 30, or something similar, one of the cooperable parts could be provided on the container base 2 and the
15 other could be provided on the floor 31 or the platform 33.

If releasable locking means is provided it is preferably such as to enable quick connection and disconnection between a container and its support. The primary function of the locking means is to increase the resistance to movement of the container from its position on the support and thereby
20 minimise the possibility of the plant being damaged by such movement.

Figures 9 to 12 show another embodiment of the invention in which components corresponding to those of the previously described embodiment are given like reference numerals except that they are in the number series 100 to 199.

25 The arrangement shown by Figures 9 to 12 differs from that of Figures 5 and 6 in that the base 120 is formed of a material different to that which forms the side wall 103 of the container. The upper surface of the base 120 is provided with a number of recesses 121 and an opening 123 extends through a lower end of at least some of those recesses. As best seen in Figures 9 and
30 12 the recesses 121 are preferably arranged in substantially straight parallel rows. It is also preferred that each recess 121 is substantially square when

- 11 -

viewed in plan and progressively decreases in size towards the lower end. The size of the openings 123 can be selected to enable the base 120 to function as a root control barrier as previously described.

A rim 125 having a curved outer surface extends around the perimeter 5 of the base 120. It is preferred that the rim 125 has a curved outer surface because that facilitates secure location of the rim 125 within a side wall recess 5 as referred to in connection with Figures 2 and 5.

It is also preferred that the base 120 is provided with a number of 10 radially extending strengthening ribs 124. As best seen in Figure 11 the ribs 124 may extend across the undersurface of the base 120, whereas the ribs 24 of the Figure 6 embodiment extend across the uppersurface of the base. Also 15 in the embodiment of Figures 9 to 12 the locating member 128 is preferably conical rather than cylindrical as in the Figure 6 embodiment, and it is preferred that the cooperable retaining member of the support structure has a substantially complementary shape.

Openings 110 may be provided at or adjacent the periphery of the base 120 so as to facilitate use of the clip 9 as previously described.

Figure 12 shows a plurality of feet 140 attached to the base 120. The base 120 may be arranged so as to permit removable attachment of such feet 20 in circumstances where it is desired to locate the container separate from a supporting structure as previously described. For example, it may be desirable or necessary to locate the container directly on the ground or other surface not having a retaining member as previously described. The feet 140 function to support the base 120 above the ground or other supporting surface to permit 25 air pruning. The feet 140 are not necessary and can be removed if the container is to be supported by a support structure as previously described.

It will be apparent from the foregoing description that a container according to the present invention has a stability factor which is not present in prior containers of the same general kind and which minimises the possibility of 30 damage to the growing plant. Combination of that container with a support structure as described provides a plant storage system having important

- 12 -

benefits not found in prior systems of a similar kind. Automatic positioning of containers in optimum spaced relationship, and the retention of the containers in that relationship, is a matter of significant benefit. The ability to collect water for recycling is another significant benefit.

- 5 A plant storage system according to the invention reduces nursery labour costs and also avoids the cost of preparing the ground of the plant storage area to enable recycling of water.

- Various alterations, modifications and/or additions may be introduced into the constructions and arrangements of parts previously described without
10 departing from the spirit or ambit of the invention as defined by the appended claims.

15

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CLAIMS:

1. A plant growth container including, a perforate side wall, a base connected to said side wall, and locating means provided on said base and being cooperable with retaining means formed separate from said container so as to thereby resist movement of the container out of a substantially upright position.
- 5 2. A container according to claim 1, wherein said locating means includes a recess or cavity formed in the undersurface of said base.
3. A container according to claim 1 or 2, wherein said locating means is substantially at the center of said base.
- 10 4. A container according to claim 2 or 3, wherein said cavity is substantially cylindrical.
5. A container according to claim 2 or 3, wherein said cavity is substantially conical.
- 15 6. A container according to any preceding claim, wherein said base is perforate.
7. A container according to claim 6, wherein said base is formed of a material different to the material of the side wall.
8. A storage system for growing plants including, at least one container according to any preceding claim, and a container support including retaining means which is cooperable with said locating means so as to thereby resist movement of the container out of a substantially upright position.
- 20 9. A storage system according to claim 8, wherein said container support includes a plurality of said retaining means each of which is cooperable with a respective one of a plurality of said containers, and each said retaining means is spaced from the or each adjacent retaining means so that a space exists between adjacent containers supported by those retaining means.
- 25 10. A storage system according to claim 8 or 9, wherein said container support includes a tray-like body having a floor and an upstanding wall extending around the periphery of said floor, said wall and said floor combining to form a water collection space, and the or each said retaining means includes
- 30

- 14 -

a member upstanding from said floor for location in a recess or cavity which forms the locating means of a said container.

11. A storage system according to claim 10, wherein the or each said retaining member projects upwardly from a platform which is connected to said floor, said platform has a supporting surface spaced upwardly from the upper surface of said floor and which is engageable by the base of a said container.
- 5 12. A storage system according to claim 9 or 10, wherein said tray-like body has at least one outlet through which water may be removed from said body.
13. A storage system according to claim 12, wherein said floor is provided
10 with means to encourage flow of water to said outlet.
14. A storage system according to claim 13, wherein said flow encouraging means includes at least one flow channel.
15. A plant growth container substantially as herein particularly described with reference to what is shown in the accompanying drawings.
- 15 16. A storage system for growing plants substantially as herein particularly described with reference to what is shown in the accompanying drawings.

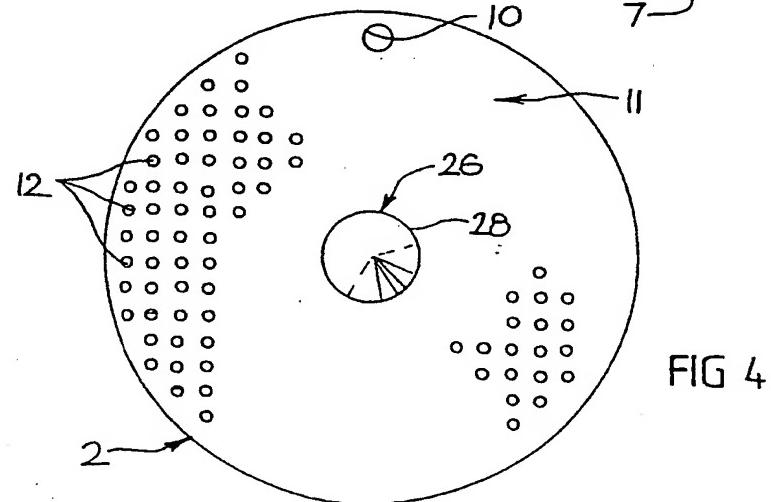
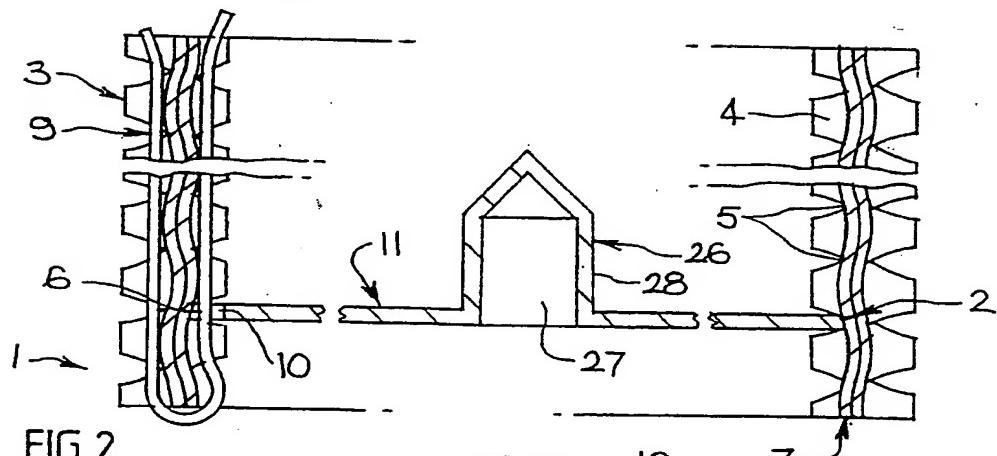
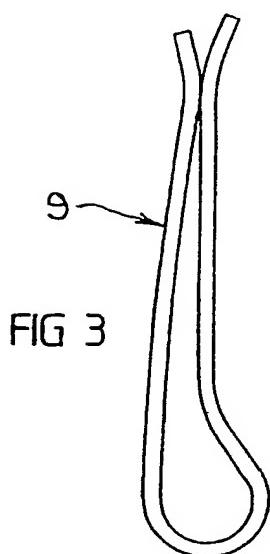
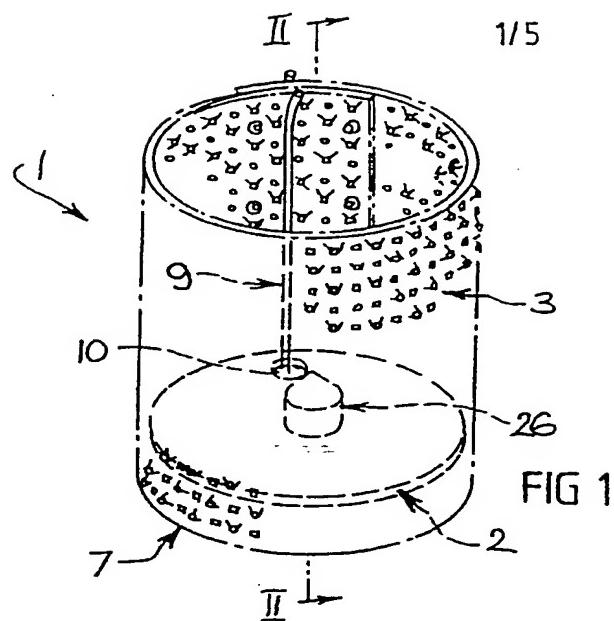
AMENDED CLAIMS

[received by the International Bureau on 29 October 1996 (29.10.96):
original claims 1-16 replaced by amended claims 1-19 (3 pages)]

1. A plant growth container including, a side wall, a plurality of inwardly and outwardly projecting hollow cones or cusps extending over at least a major part of the area of said side wall, an opening formed through the apex of at least some of the outwardly projecting cones or cusps to promote air pruning of laterally extending root growth, a base connected to said side wall, a plurality of openings formed through said base and extending over a sufficiently large part of the area of said base to promote air pruning of downwardly extending root growth, and locating means provided on said base and being cooperable with retaining means formed separate from said container so as to thereby resist movement of the container out of a substantially upright position and also permit the container to be accurately and positively positioned at a predetermined location, the arrangement being such that said container is self supporting when placed on a surface not having said retaining means.
- 15 2. A container according to claim 1, wherein said base is located a distance above a lower edge of said side wall so that a space exists beneath said base when said lower edge engages a support surface.
3. A container according to claim 1 or 2, including a plurality of recesses formed in an upper surface of said base, and a said base opening extends through the lower end of each said recess.
4. A container according to claim 3, wherein each said recess progressively reduces in cross sectional size away from said upper surface.
5. A container according to any preceding claim, wherein said locating means includes an accessible cavity formed in the under surface of said base.
- 25 6. A container according to claim 5, wherein said cavity reduces in cross sectional size in a direction away from said under surface.
7. A container according to any preceding claim, wherein said locating means is substantially at the centre of said base.
8. A container according to any preceding claim; wherein said base is formed of a material different to the material of which said side wall is formed.
- 30 9. A storage system for growing plants, including a container having a side wall and a base connected to said side wall, a plurality of inwardly and

- outwardly projecting hollow cones or cusps extending over at least a major part of the area of said side wall, an opening formed through the apex of at least some of the outwardly projecting cones or cusps to promote air pruning of laterally extending root growth, a plurality of openings formed through said
- 5 base to promote air pruning of downwardly extending root growth, locating means provided on said base and being accessible from an under surface of said base, a container support formed separate from said container and including retaining means, said retaining means cooperatively engaging with said locating means so as to thereby at least assist in retaining said container
- 10 in a substantially upright position, and said retaining means being separable from said locating means to permit said container to be moved onto and removed from said support.
10. A storage system according to claim 9, wherein said container is a container in accordance with any one of claims 2 to 8.
- 15 11. A storage system according to claim 9 or 10, wherein said cooperative engagement causes said container to be positively and accurately positioned on said support.
12. A storage system according to any one of claims 9 to 11, including a plurality of said containers, said container support including a plurality of said
- 20 retaining means each of which is cooperable with a respective one of said containers, and each said retaining means is spaced from the or each adjacent retaining means so that a space exists between adjacent containers supported by those retaining means.
13. A storage system according to any one of claims 9 to 12, wherein said
- 25 container support includes a tray-like body having a floor and an upstanding wall extending around the periphery of said floor, said wall and said floor combining to form a wall collection space, and the or each said retaining means includes a member upstanding from said floor for location in a recess or cavity which forms the locating means of a said container.
- 30 14. A storage system according to claim 13, wherein the or each said retaining member projects upwardly from a platform which is connected to said

- floor, said platform has a supporting surface spaced upwardly from the upper surface of said floor and which is engageable by the base of a said container.
15. A storage system according to claim 13 or 14, wherein said tray-like body has at least one outlet through which water may be removed from said
5 body.
16. A storage system according to claim 15, wherein said floor is provided with means to encourage flow of water to said outlet.
17. A storage system according to claim 16, wherein said flow encouraging means includes at least one flow channel.
- 10 18. A plant growth container substantially as herein particularly described with reference to what is shown in the accompanying drawings.
19. A storage system for growing plants substantially as herein particularly described with reference to what is shown in the accompanying drawings.



2/5

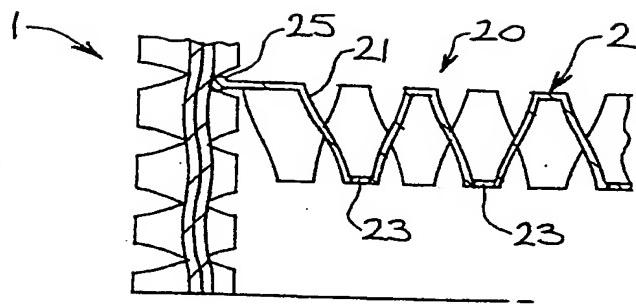


FIG 5

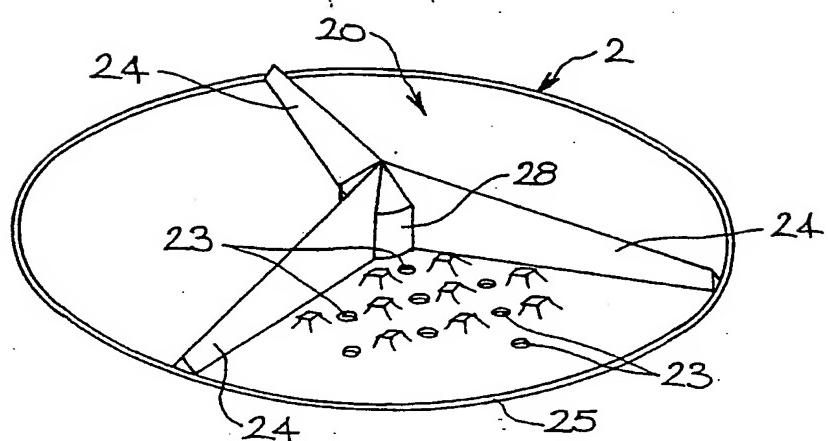
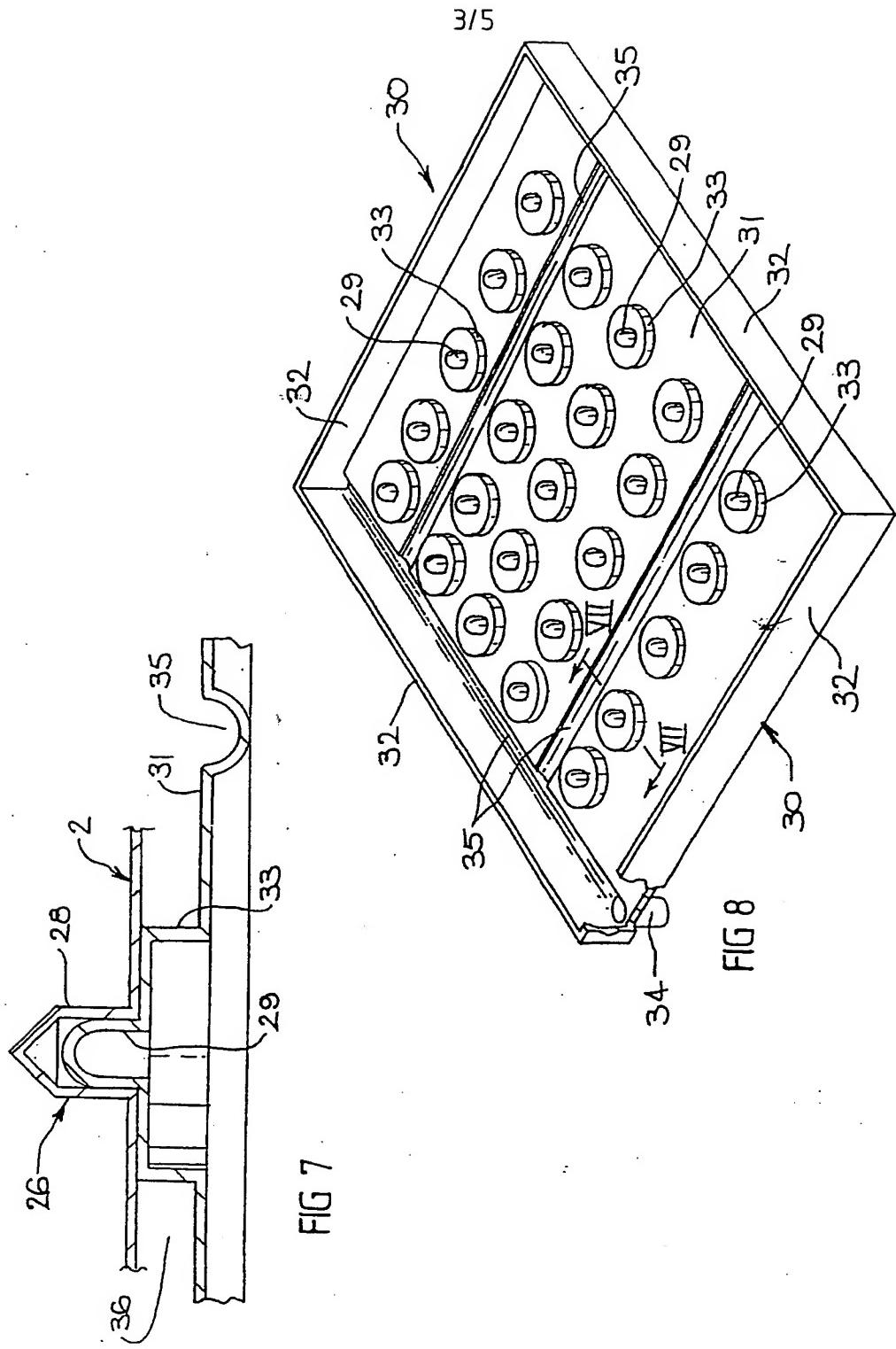
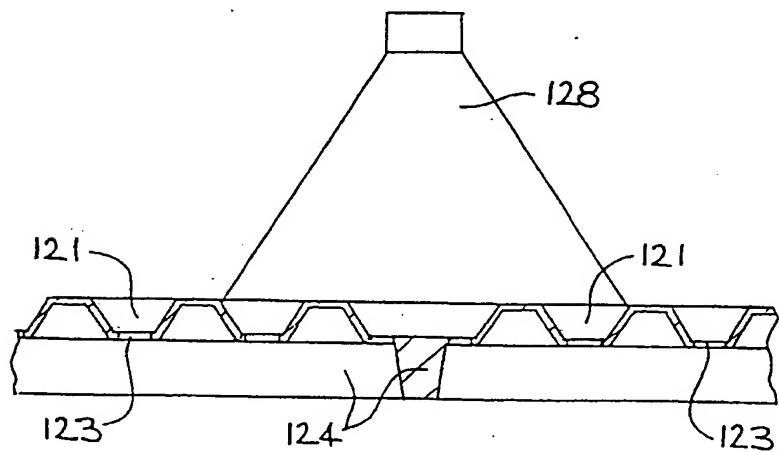
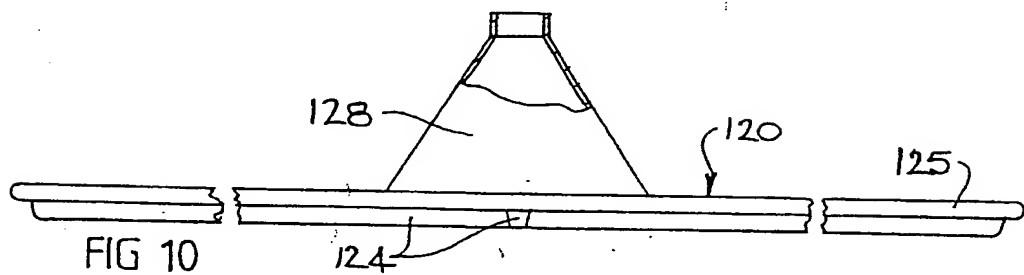
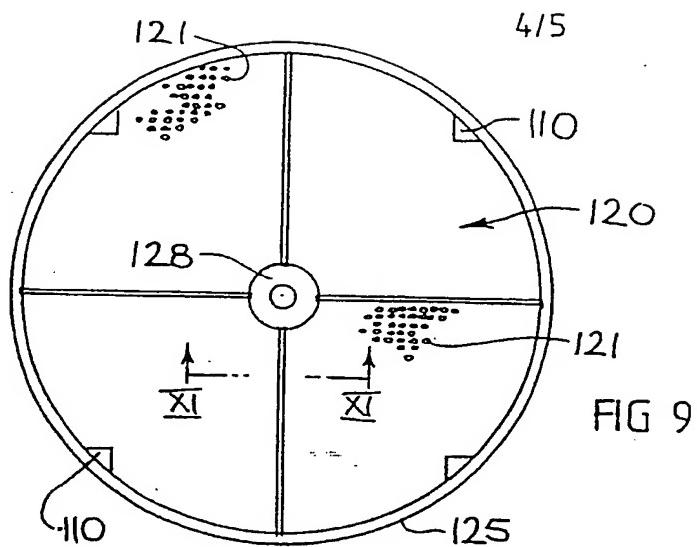


FIG 6



SUBSTITUTE SHEET (Rule 26)



5/5

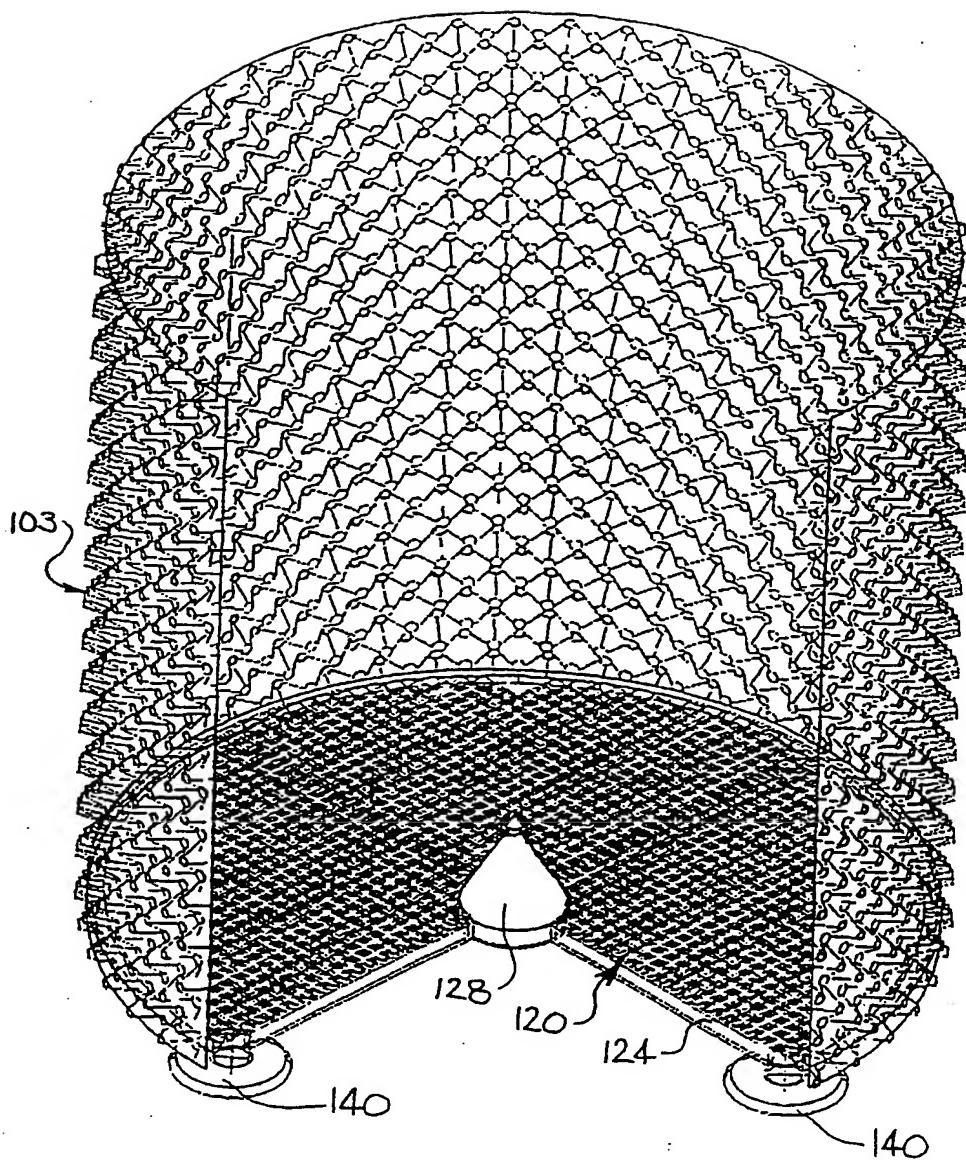


FIG 12

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SUBSTITUTE SHEET (Rule 26)

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/AU 96/00366

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl⁶: A01G 9/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC A01G 9/02Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC aboveElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Derwent: stable or stability or foot or feet or support: or erect or upright or stand.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU, 33473/78, A (ILLINOIS TOOL WORKS INC) 30 August 1979 Whole document	1, 3, 5, 7-9, 12-14
X	FR, 800066, A (SCHNIERLE M.) 26 June 1936 Whole document	1-7
X	AU, 28913/77, A (ILLINOIS TOOL WORKS INC) 29 March 1979 Whole document	1, 3, 5-7

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search
15 August 1996

Date of mailing of the international search report

29 AUG 1996

Name and mailing address of the ISA/AU
AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION
PO BOX 200
WODEN ACT 2606
AUSTRALIA Facsimile No.: (06) 285 3929

Authorized officer

JAGDISH WABLE

Telephone No.: (06) 283 2638

INTERNATIONAL SEARCH REPORT

L. International Application No.
PCT/AU 96/00366

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU, 31046/89, A (YOSHIMIDE ITO) 6 September 1990 Whole document	1, 3, 5-7
X	AU, 51865/93, A, (RONNEBY TREEFARM PTY. LTD.) 9 June 1994 page 5 lines 34-39 - page 9 lines 1-25, figs 7, 8	1, 2, 6
Y	AU, 21940/77 (495594) A (SEKISUI KAGAKU KOGYO K.K. et al.) 10 August 1978 figs 5-6	1, 6, 7, 14
Y	GB 1242580, A (MILLER H.J.) 11 August 1971 figs 1-3	1-8, 10, 12, 13, 14
Y	GB, 691575 A, (STAALDUINEN L.C.A.V.) 13 May 1953 figs 1-2	1-8, 10, 12, 13, 14
Y	US, 4553352, A (POWELL et al) 19 November 1985 Whole document	1-8, 10, 12-14
Y	US, 4739581, A (JARVIS) 26 April 1988 figs 1 & 5	1-7
Y	FR, 2568446, A) GROSFILLEX S.A.R.L.) 7 February 1986. fig 1.	1, 2, 4-7, 10, 11

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No.
PCT/AU 96/00366

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
AU 33473/78	US 4159597	BR 7801120	CA 1067290				
	DE 2808250	FI 780643	FR 2381465				
	GB 1587591	IT 1092819	JP 53107943				
	NL 7802217	NO 780661	NZ 186560				
	SE 7802188	ZA 7801157	US 4216621				
AU 28913/77	AR 217261	AT 6909/77	BE 859826				
	BR 7706867	CA 1057056	CH 614838				
	DE 2742795	DK 4658/77	ES 462981				
	FI 773105	FR 2368217	GB 1586794				
	IT 1087642	JP 53054550	NL 7710527				
	NO 773587	NZ 185300	PT 67176				
	US 4205485	ZA 7705493					
AU 31046/89							
AU 51865/93							
AU 21940/77	DE 2704722	GB 1554032	US 4118892				
GB 1242580							
US 4553352							
US 4739581							
FR 2588446							
END OF ANNEX							